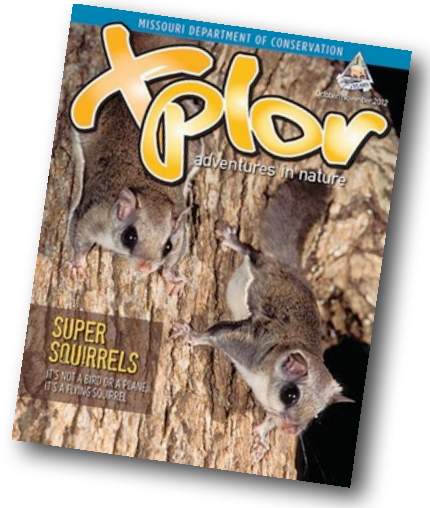
Xplor Educator Guide

Educational activities for the **October/November 2012** issue of *Xplor*

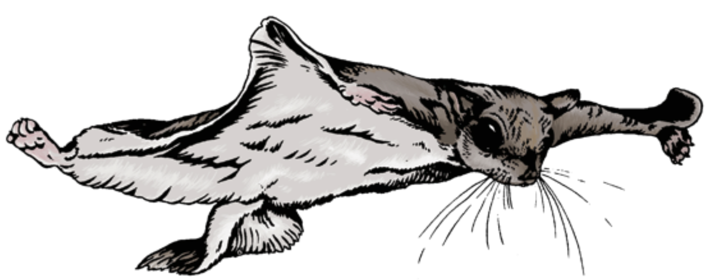


One Giant Glide for Squirrelkind

"Super Squirrels" (Page 10) is about one of Missouri's common but rarely seen critters—the southern flying squirrel. Flying squirrels launch themselves from treetops and are capable of gliding 45 meters or more. In this activity, students use paper gliders to try to achieve the same height-to-glide ratio as a flying squirrel.

Materials

- Science notebooks and pencils
- Metric tape measure (one for every three students)
- Bleachers, steps, or some other structure to elevate students safely
- Copies of pages 16 and 17 of the October/November 2012 issue of *Xplor* (at least one for every three students)



Procedure

1. Explain that researchers have found that for every vertical meter, flying squirrels can glide about three horizontal meters. This height-to-glide ratio of 1:3 means that flying squirrels could glide the length of a football field if they launched from a tree about 30 meters high.
2. Have each student write this question in their science notebooks: "Can a paper glider achieve the same height-to-glide ratio as a flying squirrel?" Ask the students to write a hypothesis in their notebooks.
3. Divide the students into groups of three. One student should be a launcher, one a measurer, and one a recorder. Have each group make the paper glider on Page 17 of *Xplor*.
4. The recorder should use his or her science notebook to create a chart. Rows should be labeled Trial No. 1, Trial No. 2, etc. Columns should be labeled with the heights of the various launching sites.
5. Have students launch gliders from different heights. For each launch, the measurer should measure to the nearest centimeter how far the glider flew.
6. Use at least five trials per height, and the recorder should fill in the chart for each trial. Calculate the average glide for each height.
7. Compare the results with the students' hypotheses. Were the hypotheses supported or not supported? Why or why not?

Options

- Ask your students if they think launching methods affect gliding distances. If someone threw a glider harder in some trials than others would it affect results? Could this variable be controlled?
- Design different paper gliders to test. Which designs glide the farthest? Why?
- After reading pages 12 and 13 of the *Nature Unleashed* student book, ask students how a flying squirrel's most famous specialized structure, the patagium, helps it survive. What other specialized structures help it survive?

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The Small and Interesting World Underfoot

"Catch Leaf Creatures" (Page 3) invites students to make a Berlese funnel to find small invertebrates that live in leaf litter. In this follow-up activity, students use hand lenses to observe captured specimens, make data tables, and compare sites to see if different environments support different organisms.

Materials

- Science notebooks and pencils
- Berlese funnels (one per group) as described in "Catch Leaf Creatures" on Page 3 of the October/November 2012 *Xplor*
- Hand lenses (one per group)
- Collection jars or vials (three per group)
- Water droppers (one per group)
- Kitchen sieve (one per group)
- Tweezers or forceps

Procedure

1. Divide the students into groups. Each group should follow the directions in *Xplor* to make and use a Berlese funnel. It works best to collect leaves from a cool, dark location, load the funnel, then move it into direct sunlight or under a bright light. Each group should collect leaves from a different location.
2. While students wait for specimens to fall into the water, have one student per group prepare his or her science notebook with a data table similar to those on Page 142 of the *Nature Unleashed* teacher guide. Rows may be labeled Specimen 1, Specimen 2, etc. Columns may be labeled Location 1, Location 2, etc.
3. Once specimens fall into the jars, have students use droppers to remove the specimens and place them on towels or in collection jars or vials. Water also may be poured through a sieve to strain out specimens.
4. Have students use hand lenses to observe captured specimens. Slow organisms may be observed on towels, but mobile specimens may need to be contained in jars or vials. Selected specimens may be drawn and parts labeled in science notebooks.
5. Have students count the number of each kind of specimen at each location and fill in their data tables. Complete taxonomic identification is not necessary, but students should observe, differentiate, categorize, and count specimens.
6. After several sites have been sampled, compare data to see if different environments support different types of organisms. Do some sites have more diversity or abundance than others? Why?

Options

- Use the same methods and sites to sample at night or during a different season. Are the same or different organisms collected? Why?
- Use field guides or other reference materials to add an identification component to this activity.

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Name It and Tame It

Mapmaking provides students with a sense of place and connects them to the outside world in larger and larger rings of perspective. **"Draw a Treasure Map" (Page 2)** suggests making a map and giving it to friends to use to find hidden treasure. In this activity, students make a map and use it to show biotic and abiotic features of their schoolyard ecosystem.

Materials

- Science notebooks and pencils
- Colored pencils and/or markers

Procedure

1. Gather students outside and explain that ecologists divide nature into two parts: living and nonliving. The biotic (living) part of nature is composed of plants, animals, fungi, protists, and bacteria—anything that is alive. The abiotic (nonliving) part is composed of Earth's physical and chemical components, including water, sunlight, temperature, and soil chemistry.
2. Have students observe the schoolyard and decide which part of it to map. The mapped area could be small or large but should include a mix of biotic and abiotic features.
3. Have students draw and color their map in their science notebooks, coloring or outlining biotic features in one color and abiotic features in another. Have students include a legend that shows how biotic and abiotic features are differentiated on the map.

Options

- Ask students if their maps include any abiotic features made by humans. If so, do these have a beneficial, neutral, or harmful effect on the biotic factors?
- Ask students if their maps include any biotic features arranged or manipulated by humans. What are these features and why were they arranged?
- Ask students if they observed in the schoolyard or can predict places on their maps where biotic and abiotic features interact. Are these interactions beneficial to one or both features? Does one benefit while the other is damaged?
- Explore David Sobel's book, *Mapmaking with Children: Sense of Place Education for the Elementary Years* for additional ideas on mapmaking for educators and students.